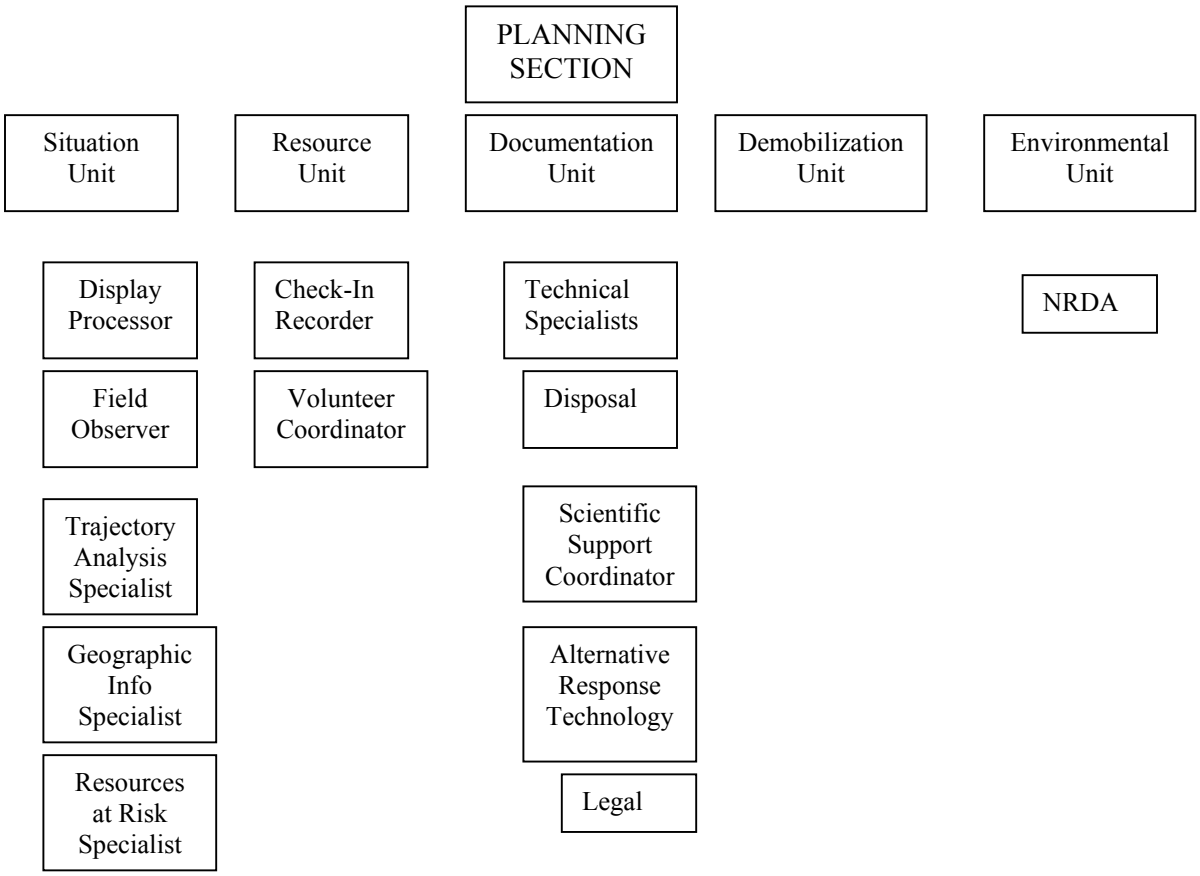
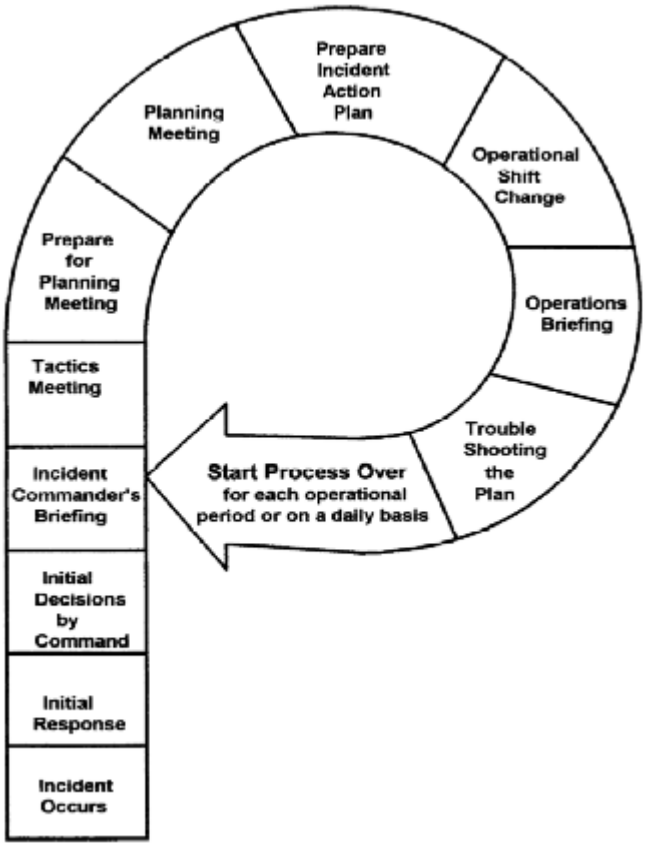
Section: 4000 PLANNING

4100 PLANNING SECTION ORGANIZATION



4110 PLANNING SECTION CYCLE GUIDE



4200 ROLES AND RESPONSIBILITIES

4210 PLANNING SECTION CHIEF (RP or Guam EPA)

The Planning Section Chief is responsible for the collection, evaluation, dissemination, and use of information about the development of the incident and status of resources. Information is needed to 1) understand the current status, 2) predict probable course of incident events, 3) prepare alternative strategies for the incident, and 4) prepare for next cycle by development of Incident Action Plan (IAP). The Section Chief has many responsibilities which include, but are not limited to, supervising the preparation of the Incident Action Plan, provide input to the Incident Commander and Operations Section Chief in preparing the Incident Action Plan, determining the need for any specialized resources in support of the incident, and assigning Technical Specialists where needed. Generally, the Planning Section Chief role will be filled by the USCG or Responsible Party.

4210.1 SITUATION UNIT LEADER (RP or Coast Guard)

The Situation Unit Leader is responsible for the collection and evaluation of information about the current and possible future status of the spill and the spill response operations. This responsibility includes the compilation of information regarding the type and amount of oil spilled, the amount of oil recovered, the oil's current location and anticipated trajectory, and impacts on natural resources. This responsibility includes providing information to the Geographic Information System (GIS) Specialist(s) for the creation of maps to depict the current and possible future situation and the preparation of reports for the Planing Section Chief.

4210.2 RESOURCE UNIT LEADER (RP or Coast Guard)

The Resource Unit Leader is responsible for maintaining the status of all resources (primary and support) at an incident. The Resource Unit Leader achieves this through development and maintenance of a master list of all resources, including check-in, status, current location, etc. This Unit is also responsible for preparing parts of the Incident Action Plan and compiling the entire plan in conjunction with other members of the ICS, and determines the availability of resources.

4210.3 STRATEGY/TACTICS SUPERVISOR (RP)
TO BE DEVELOPED

4210.4 DISPOSAL PLANS SUPERVISOR (DISPOSAL VENDOR)

4210.5 ENVIRONMENTAL UNIT (DAWR/EPA/USCG)

Other than protecting human life and safety, reducing impacts to public, natural and cultural resources represents the key motive in responding to an oil spill. The Environmental Unit is the central point within the Planing Section for determining how to best protect those resources. Specifically, the Environmental Unit is responsible for:

- Identifying all sensitive public natural and cultural resources likely to be affected by the spill, and set priorities for protecting these resources.
- Guiding the implementation of the Environmental Senstivity Index (ESI) Charts.
- Working with Operations Section to establish any addional environmental protection strategies not identified in the ESI’s.
- Working with Operations Section to coordinate wildlife rescue/rehabilitation activities.
- Establishing Shoreline Cleanup Assessment Teams (SCAT)

- Using SCAT information to recommend shoreline cleanup recommendations, priorities, and restrictions.
- Providing guidance regarding (how clean is clean) decisions.
- Providing technical review and recommendations regarding use of alternative technologies.
- Providing information to the Joint Information Center (JIC) and media regarding natural resource concerns/impacts.
- Coordinating with Natural Resource Damage Assessment (NRDA) activities.
- Planning wildlife hazing operations under the guidance and authority of state and federal fish and wildlife agencies and in coordination with the Air Operations Branch.

The Marianas Island Area Committee recognize that there is a shared responsibility between the Unified Command representatives. Plus it is broadly recognized that the critical phase of any response, regardless of size, is the initial hours after the spill. Given the importance of the Environmental Unit'' duties, and because the responsibility and knowledge base for public resources lies with trustee agencies, it is in everyone's best interest to ensure that early critical response decisions are made by the most knowledgeable individuals quickly, efficiently and effectively. Therefore, it is the policy of the Marianas Island Area Committee that the Environmental Unit be led by a representative of a government natural resource trustee or environmental agency, in our case the Aquatics Branch within the Department of Agriculture. It is highly recommended that a Deputy Environmental Unit Leader be designated to participate in all the pre-designated Unified Command meetings and briefings. These meetings and briefings include, but are not limited to, the following events:

- Initial ICS 201 Brief
- Tactics Meetings
- Planning Meetings
- Operations Meetings
- Unified Command Briefings
- Press Conferences

4210.7 REMOTE SENSING PLANS SUPERVISOR TO BE DEVELOPED

4210.8 DOCUMENTATION UNIT LEADER (RP)

The Documentation Unit Leader is responsible for the maintenance of accurate, up-to-date incident files. Examples of incident documentation include: Incident

Action Plans, incident reports, communication logs, injury claims, situation status reports, etc. Thorough documentation is critical to post-incident analysis. Some of these documents may originate in other sections. This unit shall ensure each section is maintaining and providing appropriate documents. Incident files will be stored for legal, analytical, and historical purposes. The Documentation Unit also provides duplication and copying services.

4210.9 DEMOBILIZATION UNIT LEADER

The Demobilization Unit Leader is responsible for developing the Incident Demobilization Plan, and assisting Sections/Units in ensuring that an orderly, safe, and cost effective demobilization of personnel and equipment is accomplished from the incident.

4210.10 Demobilization Plans

When drafting a Demobilization Plan for securing response operations, the following items should be included:

1. Unified Command coordination
2. Final survey
3. Clean/return equipment
4. Survey/replace equipment
5. Restore damaged areas
   a. Consultation with appropriate Natural Resource Trustee
   b. Consultation with property owners

Enclosure 26 Demobilization Plan gives a sample plan to follow.

4210.11 Personnel Debriefing

In addition to a plan, all personnel should have an official debriefing prior to release. Items that should be covered in the debrief are cost recovery instructions and after action reports.

4211 NATIONAL RESPONSE TEAM

The NRT's membership consists of 15 federal agencies with responsibilities, interests and expertise in various aspects of emergency response to pollution incidents. The EPA serves as chairman and the Coast Guard serves as vice-chairman of the NRT, except when activated for a specific incident. The NRT is primarily a national planning, policy and coordination body and does not respond directly to incidents. The NRT provides policy guidance

prior to an incident and assistance as requested by an OSC via an RRT during an incident. NRT assistance usually takes the form of technical advice, access to additional resources/equipment, or coordination with other RRT's.

4212 REGIONAL RESPONSE TEAM

There are 13 RRT’s, one for each of the ten federal regions and Alaska, the Caribbean and the Pacific Basin. Each RRT has Federal and State representation. The EPA and the Coast Guard co-chair the RRT’s. Like the NRT, RRT’s are planning, policy and coordinating bodies, and do not respond directly to incidents. The RRT’s develop Regional Contingency Plans for their regions. These plans address region specific issues and provide guidance to the OSCs for developing their area plans. The RRT’s also provide one level of review for the Area Contingency Plans. The RRT's may be activated for specific incidents when requested by the OSC. If the assistance requested by an OSC exceeds an RRT’s capability, the RRT may request assistance from the NRT. During an incident the RRT may either be alerted by telephone or convened. The cognizant RRT’s will also be consulted by the OSC on the approval/disapproval of the use of chemical countermeasures when that decision has not been pre-approved.

4213 AREA COMMITTEE

The Area Committee is a spill preparedness and planning body made up of Federal, Area, and local agency representatives. The Coast Guard Captain of the Port (COTP) will coordinate the activities of the Area Committee and assist in the development of a comprehensive Area Contingency Plan that is consistent with the NCP. This Area Contingency Plan describes the strategy for a coordinated Federal, Area and local response to a discharge or substantial threat of discharge of oil or a release of a hazardous substance from a vessel, offshore facility, or onshore facility operating within the boundaries of Guam. This plan addresses response to a most probable discharge, a maximum most probable discharge, and a worst case discharge including discharges from fire or explosion. Planning for these three scenarios covers the expected range of spills likely to occur in this area.

The key role of this committee is to approve in advance the priorities in responding to an oil spill. COTP role is ensure the respons addresses priorities as layed out in this Marianas Area Contingency Plan.

This committee shall be used as a framework for response mechanisms to evaluate shortfalls and weaknesses in the response structure before an incident, and as a

guide for reviewing vessel and facility response plans required by OPA 90, to ensure consistency. The review for consistency should address, at a minimum, the economically and environmentally sensitive areas within the area, the response equipment (quantity and type) available within the area (this includes Federal, Area, and local government and industry owned equipment), response personnel available, equipment and personnel needs compared to those available, and protection strategies.

4214 ICS PLANNING SECTION ROLES

The Planning Section, if established by the Incident Commander, will have responsibility for several important functions. They are required to maintain resource status, maintain and display situation status, prepare the Incident Action Plan, provide documentation services, and provide a primary location for technical specialists assigned to an incident. One of the most important functions of the Planning Section is to look beyond the current and next operational period and anticipate potential problems or events. The Planning Section may be organized into four unit-level positions: the Resources Unit, Situation Unit, Documentation Unit, and the Demobilization Unit.

4214.11 Display Processor

The Display Processor is responsible for the display of incident status information obtained form Field Observers, resource status reports, aerial and ortho photographs and infrared data.

4214.12 Field Observer

The Field Observer is responsible to collect situation information from personal observations at the incident and provide this information to the Situation Unit Leader.

4214.13 Trajectory Analysis Specialist

The Trajectory Analysis Specialist is responsible for providing to the Unified Command projections and estimates of the movement and behavior of the spill. The specialist will combine visual observations, remote sensing information, computer modeling, as well as observed and predicted tidal, current, and weather data to form these analyses. Additionally, the specialist is responsible for interfacing with local experts (weather service, academia, researchers, etc.) in formulating these analyses.

Trajectory maps, overflight maps, tides and current data, and weather forecasts will be supplied by the specialist to the Situation Unit for dissemination throughout the Command Post.

4214.14 Geographic Information System (GIS) Specialist

The GIS Specialist is responsible for gathering and compiling updated spill information and providing various map products to the incident. The GIS team will work with the Situation Unit and the information management officer to ensure accurate and rapid dissemination of oil spill information to the ICS.

4214.15 4214.2 RESOURCES UNIT

The Resources Unit is responsible for all check-in activity and for maintaining status on all personnel and equipment resources assigned to the incident.

4214.21 Check-in Recorder

Check-in recorders are needed at each check-in location to ensure that all resources assigned to an incident are accounted for.

4214.22 Volunteer Coordinator

The Volunteer Coordinator is responsible for managing and overseeing all aspects of volunteer participation, including recruitment, induction and deployment.

4214.3 DOCUMENTATION UNIT

The Documentation Unit prepares the Incident Action Plan, maintains all incident-related documentation, and provides duplication services.

4214.4 TECHNICAL SPECIALISTS

Technical Specialists are advisors with special skills needed to support the incident. Technical Specialists may be assigned anywhere in the ICS organization. If necessary, Technical Specialists may be formed into a separate unit. The Planning Section will maintain a list of available specialists and will assign them where needed.

4214.41 Disposal (Waste Management) Specialist

The Disposal Specialist is responsible for providing the Planning Section Chief with a Disposal Plan

that details the collection, sampling, monitoring, temporary storage, transportation, recycling, and disposal of all anticipated response wastes.

4214.42 Scientific Support Coordinator Specialist

The Scientific Support Coordinator (SSC), in accordance with the National Contingency Plan, will provide the federal On Scene Coordinator scientific advice with regard to the best course of action during a spill response. The SSC will obtain consensus from the Federal Resource Trustee Agencies and provide spill trajectory analysis data, information on the resources at risk, weather information, tidal and current information, etc.

4214.43 Alternative Response Technologies (ART) Specialist

The ART is responsible for evaluating the opportunities to use alternative response technologies including dispersant or other chemical countermeasures, in-situ burning, and bioremediation. The specialist will conduct the consultation and planning required to deploy a specific ART, and articulate the environmental tradeoffs of using or not using a specific ART.

4214.44 Legal Specialist

A Legal Specialist will act in an advisory capacity during an oil spill to whoever has made the request.

4300 COMPLIANCE GUIDANCE

4310 STATUTORY GUIDANCE

4310.1 COMPREHENSIVE ENVIRONMENTAL RESPONSE, COMPENSATION AND LIABILITY ACT, 1990 (CERCLA)

4310.2 FEDERAL WATER POLLUTION CONTROL ACT (FWPCA) AS AMENDED BY THE CLEAN WATER ACT (CWA) AND THE OIL POLLUTION ACT OF 1990 (OPA)

4310.3 NATIONAL HISTORIC PRESERVATION ACT (NHPA)

4310.4 ENDANGERED SPECIES ACT (ESA)

4310.5 RESOURCE CONSERVATION AND RECOVERY ACT (RCRA)

4310.6 NATIONAL ENVIRONMENTAL POLICY ACT (NEPA)

4400 ENVIRONMENTAL SENSITIVITY INDICES, MAPS AND INFORMATION

4410 GUAM SENSITIVE AREAS

A highly developed coral reef system that supports a large amount of marine life surrounds Guam. The reef system is highly susceptible to damage by oil and hazardous substances. A study prepared in 1977 by the UOG Marine Lab (Technical Report No. 40) identified twelve Pristine Marine Areas. They are:

Urunao/Ritidian
Double Reef
Haputo Beach
Luminao Barrier Reef
Sasa Bay and Atantano River Mangroves
Orote Submarine Cliffs and the Blue Hole
Anae Island
Cetti Bay
Cocos Lagoon and Barrier Reef
Ajagan Bay
Fadian Point
Tarague and Scout Beaches

In addition to the Pristine Marine Areas, the following are areas of particular concern:

1. Tumon Bay is the center of Guam's vital tourism industry and has many large hotels situated on or near the beach. All of the beaches in this area are heavily used for recreation by a large percentage of the 1 million + tourists that come to Guam each year. Tumon Bay also contains a Marine Preserve. (See number 6 for futher details on Marine Preserves)

2. Umatac Bay is a stopping point for whales on their migrations past the island.

3. Cocos Island and Lagoon has a significant amount of tourism. Several vessels, from Spanish galleons to modern fishing vessels, have grounded there over the years on the extensive reef system.

4. The Air Force has designated a Marine Resources Preserve on Andersen Air Force Base's coastline. This Preserve extends from Anao Point (144 56' 8" East, 13 32' 40" North) to the east end of Tarague Beach (144 53' 55" East, 13 37' 20" North) extending seaward to encompass all water capable of supporting spear fishing. The Preserve is intended to protect valuable species and their habitat. The Air Force doesn't allow spear or net fishing in the Preserve.

5. The Agana Bay area borders the center of government and business on Guam. This scenic area contains a number of small parks and recreational areas. Jet skis, wind surfers, recreational boaters, commercial fishermen and recreational fishermen use this area extensively. In the Spring, Manahac (juvenile rabbit fish) appear in high density schools on the reefs of Agana Bay. This is an important cultural event that brings large numbers of fishermen to the area. Manahac may school in the reef flats from April to October.

6. In addition to these sensitive areas, the Guam's Marine Preserves should also be treated as a sensitive environmental resource. Marine preserve are areas in which certain activities such as fishing are restricted to protect coral reef habitats and aquatic animals such as fish. Preserve also help restore reef fish stocks. Some of the names of these Preserves are:

a. Pati Point Preserve
b. Piti Bomb Holes Preserves
c. Achang Reef Flat Preserve

4410.1 PRIORITIZED SENSITIVE AREAS IN APRA HARBOR, GUAM

Following is a list in priority order of the sensitive areas of Apra Harbor, Guam:

1. Sasa Bay
2. Kilo Wharf to Spanish Steps (*)
3. Gab Gab Beach to Kilo Wharf (*)
4. Sumay Marina (*)
5. Inner Apra Harbor (*)

(Asterisk denotes COMNAVMARIANAS to protect those areas.)

4411 ENDANGERED SPECIES

Various threatened or endangered species of wildlife exist in Guam's coastal environments. Although few of these species exist within the more likely spill areas, some of these species have been sighted in the Apra Harbor area. Sea turtles sometimes nest in the Sumay Cove area and they have been seen in the Sasa Bay area. Most sightings, occur on the northern coast of Guam. The following is Guam's local list of endangered and threatened species: it is currently pending renewal/revision by the Guam legislature. The Endangered Species Act of Guam automatically incorporates and protects all species listed under the U.S. Endangered Species Act of 1973, as amended.

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Birds	Scientific Name

1.	Mariana Mallard	Anas platyrhynchos oustaleti
2.	Micronesian Megapode	Megapodius l. laperouse
3.	Guam Rail	Rallus owstoni
4.	Common Moorhen	Gallinula chloropus guawi
5.	Mariana Fruit-Dove	Pilinopus roscicapilla
6.	White-Throated Ground-Dove	Fallicolumba x. xannothura
7.	Island Swiftlet	Aerodramus vanikorensis bartschi
8.	Micronesian Kingfisher	Halcyon c. cinnamomina
9.	Mariana Crow	Corvus kubaryi
10.	Nightingale Reed-Warbler	Acrocephalus l. luscinia
11.	Guam Flycatcher	Myiagra freycineti
12.	Rufous Fantail	Rhipidura rufifrons uraniae
13.	Micronesian Starling	Aplonis opaca guami
14.	Micronesian Honeyeater	Myzomela rubratra saffordi
15.	Bridled White-eye	Zosterops c. conspicillata

Mammals

1.	Marianas Fruit Bat	Pteropus m. mariannas
2.	Little Marianas Fruit Bat	Pteropus tokudae
3.	Pacific Sheath-tailed Bat	Emballonura semicaudata

Reptiles

1.	Green Sea Turtle	Chelonia mydas
2.	Hawksbill Sea Turtle	Eretomochelys imbricata
3.	Leatherback Sea Turtle	Dermochetys coriacea

Plants

1.	Tree-Fern	Cyathea lunulata
2.	Hayun-lago	Serianthes nelsonii
3.	Ufa-halomtano	Heritiera longipetiolata

Waterfowl - Few species of waterfowl exist in Guam's coastal areas. The most common type of bird found nesting in coastal areas is the Pacific Reef Heron. It often nests in wetland areas. Some species nest along shoreline cliffs. Although they wouldn't normally be at risk from an oil spill, any aircraft operating near their nesting sites may have a very negative impact on them. The OSC shall take care to avoid air surveillance operations that may disrupt bird nesting sites.

4412 AREA SENSITIVITY CHART

Refer to Annex ____ for the Guam and Saipan ESI charts for the Guam and Saipan areas. These charts indicate the areas most vulnerable to environmental impact by an oil or HAZMAT spill.

4413 CULTURAL/ECONOMIC SENSITIVITY MAPS WITH PROTECTION PRIORITIES

4413.1 CULTURALLY AND ARCHAEOLOGICALLY SENSITIVE AREAS

4413.2 ECONOMICALLY SENSITIVE AREAS

4413.21 Surface Water Intakes (municipal/industrial)

4413.22 Recreational Areas/Marinas

4414 SAIPAN SENSITIVE AREAS

Currents and Tides: Astronomical tides are measured at Apra Harbor, Guam, the nearest tidal station. Tidal data at Apra Harbor, referenced to mean lower low water, were obtained from the National Oceanic and Atmospheric Administration, National Ocean Survey. The tides in the CNMI are characteristically diurnal.

Reference	Feet
Highest tide, observed	3.31
Mean higher high water	2.40
Mean high water	2.30
Mean tide level	1.45
Mean sea level	1.41
Mean low water	0.60
Mean lower low water	0.00
Lowest tide observed	-0.89

Temperatures of the water of Saipan Lagoon vary from 22 degrees C in the night to a high in the upper thirties. Solar heating is reported to cause large temperature variations in the shallow waters near shore.

Ocean current pattern around the CNMI are similar to those experienced by most islands in the central Pacific. The North Equatorial Drift Current which sweeps past the CNMI from east to west is responsible for much of the energy that transports water along the coast of Saipan. It has been theorized that the current tends to split on the northern and southern corners of Saipan and pass along the western coastline. This was partially verified in 1977 when drogue measurements were taken in the open coast are off Tanapag-San Roque. Drogue measurements indicated that movement of the surface current is generally parallel to the western coastline of Saipan with mean speeds of 25 cm/second.

Near shore currents are influenced primarily by the tides. Flood tide currents move in a westerly direction and ebb tides currents move in an easterly direction. It is reported that in the Garapan area, tidal currents flow northward at a rate of 0.5 to 1.0 knot during

flood tide conditions and southwesterly at the same rate during ebb tides.

Current studies suggest that the Tanapag Harbor area of Saipan is an area of convergence where water from the northern and southern parts of the lagoon meet and flow back into the ocean through the opening in the barrier reef.

Water movement is partially controlled by wind speed and direction and maintains a relatively consistent direction irrespective of tidal fluctuation. Surface drogues and dye patches generally moved to the west-southwest at speeds of approximately 0.15 knots and the subsurface currents moved in the same direction at slower speeds of approximately 0.04 knots.

Current structure within the lagoon is mainly influenced by the inflow of water across the reef and its outward transit through passes in the reef. Currents are southwesterly from Tanapag Harbor while the current in the lagoon fronting Garapan is generally northward, except for short stretches immediately north of several small passes.

At Puntan Flores, water currents generally move in a westerly direction. In Echo Bay, the mangrove swamp channel has a positive net outflow from a spring discharge in the swamp. Water movement in the principal areas of Tanapag Harbor is more variable, suggesting a potential eddying effect. It has been reported that oil and flotsam and jetsam tend to drift to the west and southwest, away from the shoreline toward the ocean, but the data also indicate an onshore drift may occur at certain times of the year. This area of convergence is also considered to be high in plankton, making it an important feeding area for fish larvae.

The lagoon area fronting the Garapan drainage basin is composed of a noncontinuous reef structure extending from the Puntan Muchot to the small boat ramp. To the south of the small boat ramp and extending beyond the southern boundary of the Garapan drainage basin is a continuous reef structure.

General circulation pattern is an offshore transport from the lagoon fronting the area between the Hyatt Hotel and the small boat ramp. The offshore water transport takes place primarily through the openings in the coral reefs in conformance with hydraulic principles.

The direction of the current is virtually independent of the tidal range. A continuous southwesterly component occurs in the lagoon area fronting the Hyatt

Hotel to the Hafa Adai Hotel, except during flood tide conditions. During this period, the transport component is nearly parallel to the shoreline only after moving southward toward the offshore direction. Studies reported the current speed at the Garapan area as moving northerly from 0.5 knots to 2.0 knots depending upon the tide.

Water in the lagoon immediately south of the small boat ramp moves north and exits the lagoon through the opening of the channel of the small boat ramp. The reason for this is the continuous reef extending beyond the southern boundary of the Garapan drainage basin impedes the offshore water transport.

The general circulation pattern of the lagoon area fronting Susupe and Chalan Kanoa is depicted on the Saipan Plan Map. The major factor influencing the current pattern in this area is the reef opening of the Sugar Dock Channel and shoal. Water within this area converges toward the reef opening-shoal area for transport out of the lagoon area.

Water to the south of the reef opening flows northward. The reef seaward of the shoal is noticeably eroded probably due to the relatively high velocities of the converging flow stream seeking outlet to the sea. The eroded reef area has a concave shape with an opening of 300 feet and a depth of 200 feet.

The circulation pattern is independant of tidal cycle (flow is in the same direction at a specific location during both ebb and flood tide). There is a continuous offshore transport in the reef opening and near the shoal. This implies that transport of water into the lagoon is primarily over the reef with the outflow primarily through the openings in the reef.

The majority of waves are generated from easterly tradewinds. The deep water wind waves are generally two to six feet in height with periods of six to twelve seconds.

Living Marine Resources: Saipan has either barrier or fringing reefs along most of its coast. Major coastal habitats are: beaches, rock shores, mangroves, coastal strand, limestone forest, volcanic forest, disturbed and urban areas and offshore inlets. A barrier reef runs along 90% of the western shoreline forming Saipan Lagoon. Most of the lagoon area has a sandy bottom but scattered rubble and coral patch reefs are also present.

Although marine vegetation stabilizes the sand in some places, patterns on aerial photographs indicate that

there is extensive shifting in most of the lagoon, however, productive coral does occur along the lagoon's outer edge.

The offshore reef protects the lagoon and shoreline from ocean swells. Inshore chop is generally light since winds are from the northeast roughly 90% of the time. A survey of fish resources of Saipan Lagoon was completed by Amesbury et al. (1979) and identified 24 fish habitats and 249 fish species in the lagoon. Twenty-two species of fish were identified as economically valuable. The mangrove area near Charlie Dock and a coral thicket offshore from Garapan Dock were recommended for preservation due to their uniqueness, diverse fish community, and limited aerial extent. The mangrove habitat contained the highest density of mullets and leiognathids. The coral thicket had the highest density of large squirrel fish and other valuable fish and a high diversity of fish species.

An *Enhalus acoroides* seagrass habitat was located at Tanapag Harbor and Garapan Dock sites. While the seagrass habitat was not specified as a unique habitat, the survey indicated that rabbit fish were found to be the most abundant food fish present, and goat fish and snappers were found to be relatively abundant. Because of the density of economically valuable fish found in the seagrass habitat, the habitat along with 20 others were also recommended for preservation.

Fish and larvae surveys in the lagoon found the highest concentration of fish eggs associated with the *Halodule uninervis* seagrass beds at Chalan Kanoa and the highest concentration of fish larvae associated with the mangrove community near Charlie Dock. Fish eggs and larvae were widely distributed throughout the lagoon and formed a major component of zoo plankton sampled. The mean density of fish eggs collected at Saipan Lagoon was 14.3 individuals per cubic meter. The highest densities were obtained in the *Halodule* seagrass bed. The maximum number of of fish larval forms collected was 3.1 individuals per cubic meter in the mangrove channel. The inner Tanapag Harbor had the highest concentration of zoo plankton.

The abundance of zoo plankton as a whole appears relatively low, however, the concentration of fish eggs and larvae is particularly pronounced. Habitats of richly developed seagrass beds, primarily composed of *Halodule uninervis*, seem to be exceptionally productive areas in terms of the production of fish eggs.

The irregular and slow water rate and the generally eddying effect of the waters of the inner harbor area make the area especially likely to accumulate

nutrients and possibly develop an enriched plankton community. After exhausting the food reserves of its egg sac, it would be advantageous for a larval fish to be in an area of enriched food supply to support its rapid development and growth. With egg production occurring in the north and south extensions of the lagoon and with allowance for the time lag in larval development during transit to the harbor area, the hatched larvae would then be in the richest area of food production within the lagoon, i.e., the mangrove channel and the inner harbor areas.

The results of the zoo plankton analysis made by Amesbury suggest that protecting the rich *Halodule* beds, the mangrove channel, and the adjacent areas are integral to maintaining and developing a viable fishery in Saipan Lagoon. Habitats rich in fish species were those associated with the barrier reef, coral rich habitats near Managaha Island, and the rich growth of *Acropora* near Garapan Dock.

Seagrass beds between Puntan Flores and Tanapag village have been estimated to cover 100 acres. It is believed that the seagrass beds from three zones: an algal mat, *Enhalus acoroides*, and *Halodule-Halophila*. The algal mat extended 100-200 feet seaward from the shoreline. The zone was characterized by warm waters, fine sands, and silt and anaerobic mud. The *Enhalus* zone was about 300 feet wide and seaward of the algal mat zone. Waters were generally turbid, but the seagrass covered about 90% of the substrate. The *Halodule-Halophila* zone was about 1000 feet from shore in clear waters in the lagoon slope growing on coralline-algal rubble. Fish increased in abundance in this zone.

The shallow near shore habitat supports marine vascular plants, *Halophila ovalis* and *Zostera nana*, in lesser abundance with the algae *Halimeda*, *Caulerpa*, *Padina*, *Hydroclathrus*, and *Turbinaria*. The characteristic invertebrate life in these meadows include nereid, spinoid, and terebelliod worms and holothurians (sea cucumbers). The black cucumber *Holothuria atra* is by far the most abundant holothurian within this habitat. The blue starfish *Linckia laevigata*, the bun urchin *Tripneustes gratilla*, and the snakelike synaptid *Opheodesome* are other echinoderms which are well represented in this habitat.

Corals of the southern end of the barrier reef are abundant on the wave-washed seaward margin, becoming scattered and patchy on the outer, shallow part of the platform. Corals become more abundant and diverse on the inner deeper parts of the platform, particularly when it grades into the lagoon moat.

Corals in the southern end of Saipan lagoon are absent to widely scattered along the inner part of the moat, and more abundant at outer parts, particularly where it grades into the barrier reef. There are diverse and abundant corals on the surface and sides of patch reefs at the northern end.

Corals of the northern end of the barrier reef are abundant on wave-washed, seaward margins, becoming patchy and scattered on outer, shallower parts of the platform where it grades into the lagoon. Corals are particularly abundant and diverse along deeper platforms and on patch reefs southwest of Managaha Island.

Corals of the northern end of the lagoon are absent to widely scattered along inner parts of the lagoon north of Puntan Flores, locally common to absent in disturbed areas between Puntan Flores and Puntan Munchot, becoming scattered and patchy in deeper parts of the lagoon and more abundant at outer parts where it grades into the barrier reef and fringing reef of Managaha Island. Corals are diverse and abundant on coral mounds and most patch reefs. Corals are also abundant on fringing reef-flat platforms to the north.

Beaches generally contain fragments of coral, calcareous red algae, mollusks, *Halimeda* (an articulated calcareous green algae), echinoids, foraminiferas, and small amounts of hard parts from marine organisms. The percent of composition varies greatly from place to place, depending for a large part upon the type of marine communities which occupy the adjacent reef and bench platforms or shallow offshore slopes. Small amounts of organic debris are also found intermixed with beach deposits, particularly along the intertidal portion of the foreshore slope where tides and waves carry algae and other plant remains up onto the beach. Storm tides and waves may periodically carry similar organic materials into the backshore beach deposits as well.

Beaches support only a marginal diversity of marine animals. Large numbers of ghost crabs *Ocypode*, burrow in clean deep sands. Small box crabs, *Calappa*, are occasionally found at the water's edge where they remain partially buried with sand. Numerous hermit crabs and amphoids inhabit the swash zone.

A great number of sea and migratory birds are also known from Saipan. These include 15 sea birds (albatross, shearwaters and petrels, storm petrels, tropic birds, and frigate birds), 18 shore birds (plovers, sandpipers, and snipes), and 10 species of gulls and terns.

Shoreline vegetation can be classified as coastal strand. The vegetation includes creeping vines, low shrubs, and grasses. Important plants in this group include *casuarina*, wild hibiscus, beach morning glory, breadfruit, and a variety of grasses. In some locations, *Formosan koa* and *Kamachile* are found.

One federally listed threatened species is reported in Saipan Lagoon, the green sea turtle *Chelonia mydas*. The CNMI Department of Lands and Natural Resources, Division of Fish and Wildlife recorded nine sea turtle nests on Wing Beach. Wing Beach is considered a turtle nesting area. Porpoises have been recorded stranding and beaching themselves in the Tanapag area.

Recreation Areas: Garapan Dock provides a pole fishing site. Trailered boats are launched from the Garapan and Sugar Docks, Smiling Cove Marina, and Seaplane boat launch ramps. Pole fishing, spear fishing, and cast net fishing commonly occur in the lagoon along the shoreline and reef edge. The *Acropora formosa* coral thicket in the lagoon offshore from Garapan attracts fishermen and skin-diving sightseers because of the diversity of fish fauna and relatively safe swimming waters. A surfing site is located on the south side of the entrance channel at the edge of the barrier reef. The entire coastline of Saipan Lagoon may be considered as a public beach with high recreational value.

Numerous small sailboats, sail boards, and personal water craft users may be found near all the hotel areas. Numerous equipment rental stands are found on the beaches and in the hotels.

Wet berthing sites are located at Smiling Cove Marina, Charlie Dick, and Delta Docks and offshore anchorages in Tanapag Harbor. Tourist oriented boats such as glass bottom boats and charter cruisers, pleasure boats such as sail boats and cabin cruisers primarily utilize these sites. Smiling Cove Marina berths both private and commercial vessels. The largest vessel is 64.5 feet long.

No historic sites listed in the National Register of Historic Places are found in Saipan Lagoon. The remains of a 1920's-era Japanese lighthouse guarding the entrance to Garapan Dock can be found on the barrier reef and appears likely to be eligible for inclusion to the National Register. Garapan Dock, Sugar Dock, and the Seaplane ramps were constructed by the Japanese and may have historic value, although they are not listed by the CNMI Historic Preservation Office.

Managaha Island and Invasion Beach sites are in the process of becoming nominated for the National Register. The entire Saipan Lagoon is proposed for listing in the CNMI Register of Historic Places.

The beaches fronting and adjacent to the Hyatt, Grand, Diamond, Pacific Islands Club, Plumeria Resort, Aqua Resort Club, Di Ichi, Hafa Adai, Pacific Gardenia and Nikko hotels are important economic resources. In 1992, Saipan reached its first 500,000 mark for the number of tourists visiting each year, with projections showing continued growth. The main tourist attraction is Managaha Island which is leased by Tasi Tours. The island resort provides many other services such as banana boat rides, snorkeling, swimming, scuba diving, sun bathing, volleyball, and picnicking.

The Coastal Resources Management Program has designated the shorelines of Saipan as an Area of Particular Concern, except for the port area of the island which is separately designated as a Port and Industrial Area of Particular Concern. All reef-enclosed waters of Saipan are designated as a Lagoon and Reef Area of Particular Concern. This Area of Particular Concern includes Saipan's Managaha Island, Bird Island, and Forbidden Island. The mangrove area near Charlie Dock is designated as a Wetland Area of Particular Concern. Naftan Rock is protected by the CNMI Division of Fish and Wildlife, due to the island's significance as a major bird rookery for the southern Marianas.

Port and Industrial Areas: There are no industrial activities occurring in CNMI waters. There are two point source discharges of treated sewage, one at Tanapag Harbor and one at Agingan Point. There is one intake point at Hafa Adai Hotel.

Tanapag Harbor is the central commercial port of entry for Saipan and the rest of the Commonwealth of Northern Mariana Islands. It is situated at the northwest side of Saipan at 15 degrees 14' north and 145 degrees 43' east longitude.

Tanapag Harbor consists of an outer anchorage area, Garapan anchorage, and the Puetton Tanapag Harbor Basin. The entrance channel is about 300 feet wide and 1500 feet long.

4414.1 PRIORITIZED SENSITIVE AREAS OF SAIPAN

(TO BE DEVELOPED)

4415 TINIAN SENSITIVE AREAS

Currents and Tides: Climate, weather, winds, waves, tides and sea current conditions are quite similar to those found on Saipan. Currents in the harbor have a tendency to push the oil southerly toward the beaches and move counter-clockwise to the commercial pier and fueling docks.

Living Marine Resources: The Tinian shoreline is formed predominantly by sea cliffs 20-100 feet high, although some cliffs reach nearly 500 feet along the southeast coast and San Jose village. The shoreline along the dock, piers, and breakwater and areas between the breakwater and dock have been artificially filled. The harbor area of the lagoon enclosed by the breakwater has been altered by dredging, filling, and construction. San Jose village is located a short distance northeast of the harbor.

Fringing reefs have a width of 540 feet, are relatively flat along the outer parts, and are mostly submerged during low tide. Corals are widely scattered along the inner part, restricted mostly to holes and depressions, and are locally abundant along the outer fringe.

Barrier and lagoon fringing reef-flat platforms have a width up to 300 feet along unaltered platforms. The outer 3/4 of the barrier reef platform and enclosed lagoon have been altered by dredging, filling, and construction of breakwater and harbor facilities. Corals are scattered but locally abundant along lagoon and seaward margins.

An oval patch reef with a length of 900 feet and a width of 540 feet exists south of the harbor area. It has a substrate of irregular reef rock with some local patches of sand, gravel, and coral algae rubble. Corals are abundant and diverse on platforms and slopes.

Recreational Areas: Taga Beach, the most popular beach area, is located east of the docks. The beach is approximately 660 feet long and 60 feet wide. Jones Beach, adjacent to Taga Beach to the north, and Tachungnya Beach to the south are also commonly used beach areas for island residents and tourists. All three beaches are composed of bioclastic materials from gravel size to coral-algae rubble. The beaches are used mostly by the local population for swimming, snorkeling, and picnicking. The main tourist attractions on Tinian include tours of historical sites at the House of Taga , the atomic bomb storage sites used prior to the bombing of Hiroshima and Nagasaki, and the newly-built casino.

The rocky shoreline is characterized by low, pitted and pinnacled pockets of bioclastic beach deposits, composed mostly of gravel and rubble. Most of the rock is Marianas limestone.

Ocean fauna is abundant and includes tuna, bonita, barracuda, sharks, sea bass, eels, flying fish, octopus, many kinds of crustaceans, and porpoises. Reef species reported include surgeons, butterfly fish, wrasses, parrot fish, damseles, and goat fish as well as eleven other fish families. The foraminifera *Calcerina spengler* and several forms of coral are found in the reef flat zones of nearby beaches. The reef margin zones have little or no coral, though the reef front zones of the beaches, in areas away from wave assault, show a decided increase in coral colonies. Corals are widely scattered to locally abundant on some knobs and mounds. The coral found in the submarine terrace zone of the beaches is not as dense as the reef fronts but does grow in scattered mounds and raised areas. Seagrass patches are widely scattered at the shore. Certain marcoinvertibrates commonly observed in the area are sea cucumbers, sea urchins, and a few gastropods along with a member of the family *molluska pelecypoda*. The beach areas are abundantly endowed with hermit crabs.

Aguijan Island (Goat Island) near Tinian is protected by the Division of Fish and Wildlife because it is a major bird rookery for the southern Marianas. Goat Island is the subject of stringent regulations governing access to the island to control the taking of coconut crabs, wild goats, and fruit bats.

Port and Industrial Areas: Tinian Harbor is located at 14 degrees 58' north latitude and 147 degrees 37' east longitude. It consists of a basin formed between the mainland and an offshore reef on which a breakwater has been constructed. The harbor has a length of over 5 miles and a width of .2 to .25 miles. The depth is 30 feet. A boat launching area is located near the juncture of the shoreline with the breakwater.

The harbor has recently become the site of extensive tuna transshipment operations. These types of operations have resulted in several oil spills and the discharge of raw sewage and garbage into the harbor waters. The CNMI government has received two proposals from private companies intending to locate oil tankers at Tinian Harbor to provide fuel bunkering services.

4415.1 PRIORITIZED SENSITIVE AREAS OF TINIAN

(**TO BE DEVELOPED)**

4416 ROTA SENSITIVE AREAS

Currents and Tides: The predominant winds of Rota are the easterly tradewinds which occur over 70% of the time. The trades are the strongest and most constant between November and June when wind speeds of 15-25 mph are common. During the typhoon season, from July to October, the tradewinds are often absent and wind direction and velocity are both variable.

Strong tidal currents and wave setup induced currents on the shallow reef flats dominate the current patterns in the West Harbor area. The flow patterns on the reef flat are dictated by the natural or man-made depressions and breaks in the reef flat. In the harbor area, the currents both northeast and southeast of the existing channel set toward the harbor and then exit through the deeper channel as a rip current. Current speeds in excess of several knots have been observed on the reef flat adjacent to the harbor and a three knot current out of the channel is estimated to be typical during the ebbing tide. The current velocities are accelerated during periods of high waves. Currents setting seaward in the entrance channel in excess of 10 knots have been reported.

Based on physical measurements, the water quality of Rota is oceanic in character and of good quality. Water temperatures are uniform ranging from 81 to 83 degrees F. Water salinity averages 34 parts per thousand, similar to ocean waters. Lower water temperatures and salinity values suggest a discharge of ground water onto the reef flat. Dissolved oxygen values range between seven and nine parts per million (ppm) with an overall mean of eight ppm, indicating saturated or supersaturated conditions. Water turbidity values were below one Jackson Turbidity Unit, indicating relatively clear waters on the reef flat.

Living Marine Resources: The reefs east and west of West Dock contain the most diverse and luxuriant reef flat community on Rota. East of West Dock, the community is distributed across the entire platform. Except for a few scattered colonies in holes and depressions, corals are mostly absent along the southern platforms. A narrow band of sea grasses, *Enhalus acoroides*, may be found along the shore between West Dock and Anjota Island. A dense mat of edible algae, *Caulerpa racemosa*, is reported at the site of the old Anjota causeway.

The shallow reef flat provides natural protection from wave energy by causing larger waves to break on the reef face and further dissipating wave energy through bottom friction as the incoming wave propagates across the

reef. Anjota Island, located on the reef, affords further protection.

Rocky shorelines are characterized as steep slopes and cliffs buttressed with boulders and blocks at places along the north and south sides of the peninsula.

Anjota Island is a low-lying, pitted and pinnacled limestone island, irregularly surrounded by blocks and boulders with intermittent patches of rubble and sand. Part of its shore has been altered by the construction of a breakwater.

Dominant coastal strand vegetation consists of the blinding tree, *Excoecaria algalocha*. *Hunig messerschmidia*, a salt tolerant shrub, is common on exposed limestone rock along the shore and around Anjota Island.

A total of 30 resident and non-resident bird species have been reported on Rota in the last 40 years. The total includes 11 migratory shorebirds which use the Japanese-Mariana Flyway and which are regular visitors to the Marianas. Six of the migratory birds are thought to breed in the Marianas. Migratory shorebirds known to have visited Rota include the golden plover, *Pluvialis dominica*, the wandering tattler, *Heteroscelus incanus*, the gray-tailed tattler, *Heteroscelus brevipes*, and the ruddy turnstone, *Arenaria interpres*. The seaward cliffs of Taipingot Mountain provide a nesting and roosting place for the Audubon's shear water, *Puffinus inherminieri*, the brown booby, *Sula leucogaster*, the common noddy, *Anous stolidus*, and the white tern, *Gugis alba*. Other birds found in the vicinity of West Harbor include the reef heron, *Demigretta sacra*, and the white-collared kingfisher, *Halcyon chloris*. The white tailed tropic bird, *Phaethon lepturus*, the red-footed booby, *Sula sula*, and the brown noddy, *Anous stolidus* also breed on Rota.

Recreational Areas: Park and recreational areas for the island residents are organized around beach areas and historic sites. Beach areas designated for protection include: Tewksberry Beach Park, Tatachog Beach park, Roadhouse Park, Pinantang Park, Teteto Beach park, Guato Beach Park, and Swimming Hole Park.

Fishing activities include reef foraging for shellfish and octopus, spearing, net casting for small schooling fish, trapping, and pole fishing over the reef during calm seas. Trolling and bottom fishing also occur from boat launching locations at East and West Harbors.

Port and Industrial Areas: West Harbor is located on a 1,200 foot wide and less that one to two feet

deep fringing reef on the west side of Taipingot Peninsula at approximately 14 degrees 5' north latitude and 145 degrees 5' east longitude. Presently, harbor improvements are underway.

East Harbor is adjacent to Songsong Village on Sosanjaya Bay on the southwest coast at approximately 14 degrees 4' north latitude and 145 degrees 5' east longitude. The harbor is used primarily for small crafts. The harbor area is approximately 300 feet wide, is much more narrow than West Harbor, and is one to two feet deeper than West Harbor, thus providing less natural wave protection.

East Harbor has two concrete docks. These docks were severely damaged by Typhoon Pamela in 1976. An offshore mooring and pipeline are currently used to off load diesel fuel and gasoline from Mobil Oil Micronesia tank vessels.

4416.1 PRIORITIZED SENSITIVE AREA OF ROTA

(**TO BE DEVELOPED)**

4500 STRATEGIC RESPONSE PRIORITIES

4510 GENERAL HIERARCHY OF STRATEGIC PLANNING PRIORITIES

Spill response will follow a general strategy of stop the discharge, contain the spilled product, protect sensitive resources and remove the spilled product. The preferred cleanup tactic is to use mechanical means of removal. The OSC will generally follow the recommendations of the NOAA Shoreline Countermeasures Manual with input from appropriate local sources of expertise. The general strategies should include the following:

1. Response Priorities
   a. Protect human life and health
   b. Minimize ecological impacts
   c. Minimize economic and public impacts

2. Determination of protection priorities

3. Determination of appropriate countermeasures

4. Determination of natural collection areas and boom sites throughout the area. Currents within Outer Apra Harbor are usually less than 0.1 knot so wind is the primary factor in influencing the movement of oil on the water. The easterly winds on Guam will tend to blow oil and other debris in a westerly direction. Experience has

shown that there are several areas in Apra Harbor where spilled oil often collects. The majority of oil collection has been in the corner formed by Wharves F-2 and F-3 near Piti channel and along the breakwater west of Wharf G. Three major catchment areas along the Glass Breakwater are located at the dog leg, the hook at the end of the Breakwater and at the indentation midway between the previous two sites.

5. Determination of containment techniques

6. Determination of removal techniques

7. Determination of shoreline cleanup techniques/strategies. The OSC shall follow the shoreline evaluation and assessment process specified in the NOAA Shoreline Countermeasures Manual. The makeup of this organization will vary with the spill.

4600 STRATEGIC RESPONSE OPTIONS

4610 PROTECTION STRATEGIES

Existing methods and technology used in protecting resources from oil spilled on the water are based on three principles:

1. Oil has a density less than water and floats. Under turbulent conditions, the oil can be physically dispersed in the water column and not exist as a surface slick;

2. Oil has properties that attract it to some materials and displace it from others; and

3. Oil is a compound that undergoes rapid changes once spilled into the water. Evaporation, dilution, and emulsification can rapidly change oil properties, requiring different methods of shoreline protection and recovery as the spill progresses.

4611 CONTAINMENT STRATEGIES

(**TO BE DEVELOPED)**

4612 RECOVERY STRATEGIES

Recovering oil on the water is limited to skimmers, sorbents, and manual recovery. Recovering floating oil would appear to be an easy task: oil floats on water so all that is required is a means to gather the floating oil. In fact, recovering floating oil is one of the most difficult operations to perform. Effective

recovery leaves less oil to be deposited on the shoreline. Skimming oil off the water surface frequently collects large amounts of water, which increases the volume of product to handle. Skimmers may operate independently, be mounted on vessels, or may be completely self-propelled. Skimmers are classified in five different categories: weir, suction, centrifugal, submersion, and sorbent or oleophilic skimmers.

Key factors in selecting appropriate skimmers are the amount of debris present, the viscosity of the oil, and the water depth. Area Committees should match up skimmer requirements with their proposed protection strategies and work with response organizations to determine whether their equipment and capabilities are adequate to meet protection requirements.

Sorbents are not primary oil cleanup techniques but are used mainly during final cleanup or when small or trace amounts are being removed. They are used in areas that are inaccessible to skimmers and where heavy equipment may cause excessive damage. Sorbents are measured by how much oil they will recover in weight compared to the weight of the material. The most efficient sorbent can sorb nearly 20-25 times its weight in oil. Overuse of sorbents can generate a large disposal problem because most used sorbent material is placed in landfills, although some areas have approved incineration. Recycling of sorbents should be done whenever possible.

Manual recovery involves using hand equipment to recover oil, primarily with rakes and shovels to lift tarballs or tarmats from the substrate or water surface. Heavy or weathered oil can sometimes be recovered by hand, depending on its viscosity. The recovered oil is bagged for later disposal. Manual removal is not considered a primary means of removing oil from the water and it is used most often in shoreline cleanup.

4613 DISPOSAL STRATEGIES

(TO BE DEVELOPED)

4614 COUNTERMEASURES

Because of the many operational, logistical, and environmental limitations, mechanical methods cannot protect all sensitive shorelines. In those areas where these methods do not work, the only alternatives will be taking no action at all or using non-mechanical methods that are usually implemented away from the shore in open water. All chemical countermeasures require RRT consultation.

Some examples of countermesures are: chemical dispersants, herding agents, solidifiers, burning, construction of permanent structures, or taking no action at all.

4614.1 DEFENSIVE

There are two defensive countermeasures available to responders, both of which are physical actions that could be taken: operational restrictions and modifications and the erection of permanent structures.

4614.11 Physical

One defensive physical countermeasure available to responders would be instituting operational restrictions and modifications. Altering vessel patterns and operational procedures may be a viable option to reduce risk to environmental areas that cannot be adequately protected with mechanical means. This can be achieved through local councils, port safety committees, and international agencies, such as the International Maritime Organization (IMO). These efforts could include traffic rerouting, establishing exclusion zones, modifying or restricting operational procedures (such as requiring booms), limiting bunkering during seasonal coral spawning, and requiring pilots and tugboats to guide vessels into port in high-risk areas.

A second defensive physical countermeasure would be the construction of permanent structures. Permanent structures are intended as preventative measures to eliminate or reduce the impact of a spill in advance of the actual incident. Some structures could be staging areas for response equipment deployment, some for isolating the potential source, and others for isolating the sensitive area to be protected. These structures might include permanent booms at piers, permanent boom anchor points and rollout mounted booms, and tide gates or permanent barriers erected around a potential spill source.

4614.2 OFFENSIVE

There are both physical and chemical offensive countermeasures available for use by oil spill responders. Physical offensive countermeasures would be burning, hazing, or taking no action at all. Chemical offensive counter-measures would be using chemical dispersants, herding agents, solidifiers or shoreline pre-treatment agents.

4614.21 Physical

There are three offensive physical counter-measures available to responders. They are burning, hazing, or taking no action at all.

Burning spilled oil produces the highest potential rate of oil removal. Whether the oil is burning due to the casualty or being ignited in situ, the results are worth considering. Oil must be a minimum of two millimeters thick to maintain a burn on the water surface. Otherwise, the cooling effects of the water below will extinguish the flame. The tradeoff between creating an air plume of soot and combustion by-products and leaving the oil on the water surface needs to be evaluated.

Hazing is the intentional use of mechanical devices to generate loud noises to prevent wildlife from coming in contact with floating or stranded oil. However, the devices have a very limited period of effectiveness because wildlife quickly acclimate to them. Hazing should be coordinated with local fish and wildlife representatives to ensure that greater harm is not being done to animals than would happen with no action. In addition, responders must be aware of the chance that they could actually haze animals away from their habitat and into another oiled area.

No action should be considered when the response is likely to cause more injury to the resource than would the oil alone. An example would be a marine mammal pupping area where any physical disturbance might either drive the animals into the water (and the oil) or cause the mothers to abandon the young.

4614.22 Chemical

Chemical dispersants are specially formulated compounds designed to reduce the oil-water interfacial tension and allow the oil to break into small droplets that mix into the water column. Dispersants are normally used in off shore waters to prevent oil from moving into sensitive environments. They may work when other protection strategies are most likely to fail, that is, in conditions of strong currents and high waves. Dispersant application by aerial spraying is limited by high winds, fog, and darkness. Effectiveness drops rapidly with time after the initial release of the oil. The tradeoffs between increasing oil concentration in the water column and removing oil from surface water will have to be evaluated.

Herding agents are products that push or compress oil slicks on the water surface. They have low solubility

and volatility, and must have a spreading pressure greater than the target oil. Application rates are very low (1-15 gallons per lineal mile). They are most effective on thin films and low viscosity oils. Weather and sea conditions must be calm, with no breaking waves, low currents, and no rainfall. Their optimal use may be in harbors to control slicks under docks and piers and in water too shallow for booms. Commercially available products vary widely in their aquatic toxicity.

Solidifiers are usually organic polymers that mix with oil and turn it into a rubber-like solid or gel. The most limiting factor is the amount of product needed to solidify a given volume of oil; current solidifiers require application rates of 1 to 200 percent. The solidifier must be mixed into the oil, making it more difficult to treat emulsified, thick, or heavy oils. There is also concern about inconsistent application rates and resulting areas of liquid, semi-solid, and solid oil. Available products are insoluble and have very low aquatic toxicity, thus the greatest environmental concern will be the ability to recover the solidified oil from the water surface.

Shoreline pre-treatment agents prevent oil from adhering to a shoreline. There are two sub-classes: film-forming agents and wetting agents. However, currently there are no commercially available products for oil spill applications. There would be concern about contact toxicity and smothering since these products would be applied directly on clean substrates. This category does not include products that are dispersants.

Due to the sensitive nature of the extensive reef systems surrounding Guam, Saipan, Tinian and Rota, the Government of Guam policy and Government of CNMI policy prohibits the use of chemical countermeasures in the waters of Guam and the CNMI. In addition, dispersants will either be ineffective or unnecessary on the types of petroleum products imported into the islands. Studies have shown that dispersants may be effective at mitigating damage in mangrove areas. The Area Committees may consider pre-approval of dispersants in mangrove areas. The OSC will follow the guidelines of the NCP and the Regional Contingency Plan in obtaining concurrence to allow dispersant use in the Exclusive Economic Zone surrounding Guam, Saipan, Tinian and Rota. The Area Committees see little need to use dispersants on offshore spills to the west of Guam, Saipan, Tinian and Rota since the prevailing winds and currents will carry the product away from land.

The Area Committees feel it's not necessary to use bioremediation on coastal spills since most of the products imported into Guam and the CNMI are volatile products that

will evaporate readily. The Committees will consider the use of bioremediation on inland spills on a case by case basis.

Gelling or elasticizing agents can enhance the recovery of spilled oil. They will, however, inhibit the natural dispersion of spilled oil. The Area Committees will consider the use of these agents under the following circumstances:

1. The product is high flash point, low volatility product such as diesel fuel.

2. The spill is fully contained.

3. It's possible to quickly bring sufficient skimmers to the site of the spill.

4. Guam and the CNMI are always in Typhoon Condition IV.

4615 PRE-APPROVAL PROCESS FOR GUAM AND THE CNMI

There are none.

Future consideration for chemical countermeasures will rely primarily on live coral impact where testing can be done in controlled environments through the Guam EPA on Guam and the Department of Lands and Natural Resources in the CNMI. If a product is found to be acceptable tot he scientists and environmental technicians, their recommendations will be forwarded through their proper chains to the Federal EPA. Upon EPA approval, the product name, chemical characteristics, mitigating capabilities, quantity and location of local storage, and nearest distributor will be introduced to the Area Committees for final acceptance and entered into this section of the Area Contingency Plan.

4700 APPLICABLE MEMORANDUMS OF UNDERSTANDING/AGREEMENTS

1. MOU Between U.S. Coast Guard and the Environmental Protection Agency -- Signed 4 January 1982

2. MOU Between the Departments of Interior and Transportation Concerning Respective Responsibilities Under the National Oil and Hazardous Substances Pollution Contingency Plan -- Signed 16 August 1971

3. Interagency Agreement Between the U.S. Fish and Wildlife Service and the U.S. Coast Guard for Participation in Pollution Incidents -- Signed 24 July 1979

4. Instrument of Redelegation of Sections 2(d), 2(f), 2(g), 3(a), and 4(b) of Executive Order 12316 of August 14, 1981 from the U.S. Coast Guard to the Environmental Protection Agency on Response Actions.

5. Other applicable MOU's are found in Volume X of the Marine Safety Manual.

6. The Statement of Agreement and Understanding on Boating Safety between the U.S. Coast Guard and the CNMI -- Signed July 1989.

7. MOU between the U.S. Coast Guard and the CNMI concerning Marine Environmental Protection and Response to marine Pollution -- Signed 1993.

8. MOU between the U.S. Coast Guard, CNMI Emergency Management Office, and Shell Marianas concerning the Storage, Maintenance, and Use of Oil and Hazardous Material Response Personal Protective Equipment -- Signed May 1995.

Note: Copies of applicable MOUs are available upon request from the U.S. Coast Guard Marine Safety Office.

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